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The following account of engineer support of an advancing army is based on the concrete example of the experience of the 2nd. Shock Army on the Volkov front during the breakthrough of the Leningrad blockade between the 12th. and 17th. of January, 1943.

This operation is of considerable interest from an engineer point of view. The great difficulties presented by the wooded-marshy area, winter conditions, as well as the extremely closely built enemy defensive works and obstacles, placed particular attention on the engineer support of the operation. The proper solution of all of these problems demanded the full attention and careful work of the engineer staff, the proper support by and the full utilization of the engineer troops during an attack.

During the sixteen months of the blockade of Leningrad the 2nd. Army frequently inflicted heavy blows on the enemy. These strikes were not of a decisive character but in the long run they disclosed, on a large scale, the enemy's defensive system.

Particularly is this true of the active operations of the 2nd. Army of the Volkov front in August, 1942, which army was able, to a considerable extent, the character of the defences of the Mga-Shliusselburg enemy grouping. In the area of the attack a road was built, the troops conducted battle training, and the engineer and other units gained experience in the forming up and action of assault groups and detachments, demolition groups, in the laying of mine roads, in the construction of roads following the advancing troops. This experience certainly was of advantage in the time of the attack in January, 1943.

Operational Situation (Sketch 17 - not included in the translation - can be found on page 117 of the original.) The Mga-Shliusselburg enemy group occupied in January, 1943, the eastern shore of the Mga River, the southern shore of Lake Ladoga, Lipka, Gontovaya Lipka, Serebrye, and Lodva.

The area of the breakthrough of the 2nd. Shock Army extended from the southern shore of Lake Ladoga on the right, on the left, to the

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boundary with the 8th. Army, which was south of Gaytologo. The general depth of the enemy's defences in the area Lipka-Marino was 14 kms., and in the direction of Apraslin Gorodok, Sinyavino, Dubrovka - 15 kms. The 2nd. Shock Army, being released from the front reserve, arrived in the sector designated for the breakthrough at the beginning of January, (The area was Lipka-Gaytologo.) partly exchanging positions, with absorbing into its establishment, the units of the 8th. Army division holding the sector.

The 2nd. Shock Army was given the assignment of breaking through the enemy's defences in the area Lipka, Labour Settlement No.1, Sinyavino, Gaytologo, to unite with the troops of the Leningrad Front, and were to deliver a simultaneous eastern strike from the western shore of the river Neva.

The 8th. Army was given the assignment to deliver a thrust with its right-flanking divisions in the sector (exclusive) Gaytologo, Voronezh, along the railway line towards Mga, coordinating the strike with the breakthrough of the 2nd. Shock Army. With its left-flanking divisions the army had the task of supporting the advancing front and to cover the left flank of the breakthrough.

Characteristics of the Terrain : The area occupied by the German steelburg enemy grouping, was a wooded, marshy plain. In the center of the area, in a clearing, there was a peat-cutting area, cut by many canals and excavations, with a road network to move the peat. Near the peat-cutting area eight workers' settlements were located.

South of the peat-cutting area, there lies a rise, with quite a decided drop to the north, but to the south it turned into a swampy, wood covered plateau, with many lakes, brooks and streams. All these streams did not present obstacles by themselves, but their swampy nature required for a crossing special engineer provisions. The swamps, although they were not drained, were, on the whole, passable to the infantry. The woods, in the main coniferous, were small treed on swampy ground. Adequate surfaced and dirt roads gave the enemy the capability of manoeuvre from the south and south-west.

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In the middle of January the area was covered with heavy snow, with up to 40 cm. in the woods and up to 20 cm. in the open areas. The snow had frozen after the December thaw and, on the whole, allowed the movement of troops without skis. The swamp had frozen unevenly; most of it had frozen to a depth of 20 cm., but parts of it, those covered with thickets and snow had not frozen at all. The little depth of the frost presented a serious problem for the movement of tanks and artillery. It was in places, even for the movement of personnel without skis. The ice on the rivers varied from 20 cm. to 50 cm. in thickness, on Lake Ladoga the average thickness of the ice was 40 cm. which made the movement of all types of motor transport possible. The road network, besides the permanent roads, contained a large number of military roads which had been built in the summer of 1942; the existing good bridges allowed the crossing of the rivers without regard to the ice. The main roads were being maintained by the road-building troops of the Front and Army.

The weather in January, 1943, was quiet, there were temporary winds from the west and south, there was no snowfall, the temperature varied from -12° to -16° with low visibility. The last made movement by the airforce difficult.

The Enemy's Defence. According to the information gathered by all types of reconnaissance the enemy had constructed the following defenses in the Mga-Shlisselburg area (see Map 17 - not included in the original - missing in the original)

The forward defended area which had been constructed during the receding battles ran along the southern shore of Lake Ladoga, to workers' settlement No. 8, Gontovaya Lipka, Tprtoolova, Porech'ye.

The second defended zone followed the southern shore line of Lake Ladoga, to workers' settlement No. 1, workers' settlement No. 5, Sionovno, settlement Mikhaylovskiy, Sionovo Karbusel'.

Each of the defended zones consisted of a mutually supporting system of centres of resistance and separate fortified positions designed for all around defence. The centres of resistance and the f

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ified positions had been constructed, as is correct, at the main routes, at the crossroads, in settlements, on heights, and in thick woods. The defensive positions had been sited on obvious boundaries, along rivers with steep shores, along the lines of lakes, and swamps, in the approaches and the depths of forests. The areas in front of the forward edge of the centres of resistance and the defended localities, as well as that lying between them, was always open to observation and covered by fire; besides that in the intervals were located submachine gunners who were supported by all types of fire from the depth. Between the defended zones strong points were located (workers' settlement No. 7, Ist. Estonian settlement), which, together with the main centres of resistance and the main defended positions, created fire pockets.

The centres of resistance covered an average front of from 2 to 2.5 km. in length and 1 to 1.5 km. in depth, and included from two to four company defended positions, each of which had a front of 400 to 500 metres and a depth of about 750 metres. The defended positions consisted of two to four platoon defended areas, equipped with fire positions, and emplacements connected to each other by trenches, communication trenches, and covered passages. Each centre of resistance and defended position was designed for all around defence, had reserves of food and ammunition, and was capable of continuing resistance even after encirclement.

The main ^{defence} ~~defence~~ consisted of heavy and light machine gun fire, anti-tank guns and mortars, reinforced by antitank and antipersonnel obstacles made up of cuttings, cleats, embankments and felled trees, wooden and earth walls and fences, mine fields, and snow walls. To protect the defended localities, the machine gun nests and trenches from capture by reconnaissance patrols and assault groups, the enemy had made extensive use of booby traps.

The anti-tank defence of the fortified system depended on, in the first place, the fire of the supporting artillery from special positions at a distance of 3 to 4 kms; in the second place, on the fire of the anti-tank guns and weapons, as well as the heavy calibre machine guns.

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which had been pushed forward and were forming the anti-tank positions; and, in the third place, on aircraft, which could be called upon by the commanders of the ground troops. To cover all eventualities, the anti-tank defence had been strengthened by minefields.

The fortifications of the defended area consisted of one three-embrasure wood and earth emplacement with covered blindages, open gun nests, and artillery and mortar positions. The dugouts, connecting passages and trenches were full size, and where the ground did not allow digging, the enemy had constructed wooden and earth walls with traverse embrasures and gun posts. Together with the connected passages frequently there were constructed covering fences, woven of brush and of a general height of 1.5 meters. Behind the fences were located, consisting of pits, low wire entanglements, mines or flamethrowers.

As an illustration the characteristics of two centres of resistance are given in detail:

The centre of resistance facing Lake Ladoga (Lipka) was defended by the greater part of one infantry battalion. The lake shore was covered by antipersonnel obstacles (Sketch 18 - not included in this edition can be found on page 120 of the original). The defences of the centre consisted of dugouts for all the battalion personnel reinforced by many wood and earth emplacements. These emplacements consisted of casemate 2.5 m. by 2.5 m. and were covered by 24 cm. The dugouts and the emplacements were connected by communication passages with one located 30 to 50 m. to the rear. These shelters were frequently located under houses or in the embankments of the Old and New Ladoga Canal. The centre of ^{resistance} ~~resistance~~ also had strong anti-personnel obstacles in front as well as in the depth of the system.

The centre of resistance at copse "Iruglaya" was the main point in the German defensive system. It lay at the main road connecting with the river Neva, covered the approaches to Sinyavino, the main point of defence, and was laid out on a height which dominated the surrounding territory. The height was surrounded by swamps which pre-

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vented the passage of tanks even in winter. The Germans had paid particular attention to the fortifications of the copse. Besides that, wide minefields and artificial obstacles, the copse was surrounded by a wood and earth wall of a height varying between 1.4 and 2.8 m. and occasionally reaching up to 3.3 m, and of a width of 1.5 to 2.5 m/ on the crest of the wall machine gun emplacements and observation points had been constructed.

The sides of the walls were covered with sticks and brush netting. For defence against enfilade fire and for protection against flying splinters traverses had been constructed. The fortifications of the copse consisted of a system of deep dugouts and trenches reinforced by wooden and earth fire positions. At the beginning the garrison consisted of a battalion but it was later increased up to a regiment. (Details not included in the translation - can be found on page 121 of the original).

The main conclusions which can be drawn from the analysis of the enemy's defences are:

1. Despite the fact that the Germans had occupied this sector in the winter 1941/1942 the system had not been reinforced by permanent fortifications. All the centres of ^{resistance} ~~resistance~~ and strong points had a dense system of fire, based on enfilade and cross fire by machine guns, mortars and guns. Wide use was being made of artillery fire in front of the mine fields and defences. In front of the defence line there were almost uninterrupted zones of anti-tank and anti-personnel obstacles constructed. The centre of resistance "Kruglaya", for example, had for each km. of front, up to 20 heavy machine guns, 6 to 10 mortars, 4 to 6 antitank guns. The garrisons of the centres of resistance and defended posts had adequate reserves of food and ammunition so that they could operate for a considerable time without re-supply.

2. The destruction of the enemy's coordinated fire system could be achieved by the destruction of a number of large segments of resistance, which included the centres Lipka, copse "Kruglaya" and Shcheglov. Even after the elimination of these points the enemy retained the

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ability to organize "tactical pockets" and to continue opposition for a considerable time.

3. The engineer defences built in the area by the enemy, although they were not of a permanent type, were still a serious obstacle. This required the preparation of ^{special} ~~serious~~ demolition and assault groups, before an attack against the defended enemy positions could be launched.

Engineer Support of the Operation

The Front Commander assigned the following tasks to the engineers: participation in the breakthrough of the enemy's front; to cover with obstacles the flanks of our advancing troops; to fortify the captured localities and to lift the mines in that area; the construction of supply and evacuation roads.

The planning of the engineer support of the operation was accomplished by the Front Engineer Commander with the assistance of a Field Headquarters which had been formed from the engineer staff of the Front consisting of the chief headquarters of the Field with three assistants (one each for reconnaissance and camouflage, for obstacles, and for supply), and two officers responsible for coordination.

The plan for the operation was worked out as exercise 9, and all the instructions to the troops were issued as "aids" for the conduct of a command post exercise. The participating troops were instructed to camouflage their concentration in the rear by locating in forests and settled localities and by moving at night only.

The engineer plan contained the sum total of all of the preparatory measures taken by all the troops and staffs. The time allowed for the preparation was about a month, during which time much work was done by the engineer troops.

Engineer reconnaissance was conducted by sapper troops from observation posts. Besides that, a small group of sappers participated in the reconnaissance missions performed by the rifle subunits.

After the staff of the Engineer Field Headquarters arrived in the concentration area it collected all the information gathered by the reconnaissance of other troops and on the basis of this prepared a

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sketch of the enemy's defences. This sketch was continuously amended by newly received information.

The preparation of the departure position was made much easier by the utilization of the existing defences. But it was not sufficient to use the existing defences only. It was necessary to supplement these with new ones, some even having to be removed, and through the remaining passages had to be cut. The formation commanders, not believing that their troops would be capable of preparing the base of operations in one or two nights, sent out three or four days in advance individual subunits with sappers to prepare the forward edge of the base of operations. Furthermore, much work was done during the day, and not enough attention was paid to camouflage, and therefore much movement in the forward area was observed. All this certainly did not assist in hiding the preparations for the operation.

The road network in the forward areas occupied by the troops was good from east to west and south-west. There were enough bridges across the rivers Naznaya and Chernaya. Several of these were strong enough to allow passage of 60-ton tracked vehicles. The generally swampy character of the area was much more passable in winter than in any other period of the year. The quiet weather in January also made road conditions more favourable.

The Preparation for the Attack

As a special engineer measure had to be counted the preparation of assault and demolition detachments. The main type was the battalion detachment, but besides these also company detachments were organized. Sappers, which composed the bulk of these detachments, were taken from the personnel of the divisional sapper battalions or from the battalions of the engineer brigades which were attached to the divisions. The average numerical strength of these detachments was 150 men, half of which were sappers. But in practice and depending on the situation, the engineer equipment of the detachments was different.

The composition of a typical assault and demolition detachment is shown in Table 1.

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Subunit	Specialty	Officers	NCO	E/M	Total
Command Group	Sappers	3	-	1	4
Recce Group	CH men	-	-	3	3
	Sappers	1	3	15	19
	Total	4	3	19	26
Mine laying Group	Sappers	1	3	21	25
	2 teams				
	Ampule throwers		2	4	6
	CH men			3	3
	Total	1	5	28	34
Assault Group	Sappers	1	3	24	28
	Rifle Platoon	1	3	21	25
	3 AT Crews	1	3	6	10
	2 teams				
	Ampule throwers	1	2	5	8
	Crew Heavy Machine				
	Guns		1	5	6
	Total	4	12	61	77
Medical Detachment	Medical personnel	-	1	2	3
Service Section	Sappers	-	2	8	10
Grand Total		9	23	118	150.

The engineer equipment of each detachment consisted of: 4 to 6 mine detectors, 8 to 10 pincers, 8 to 12 grapnels, 10 to 18 wirecutting shears, 20 to 25 charges VV of 3 to 5 kg., 20 to 30 bangalore torpedoes VV for the destruction of wire entanglements.

In the engineer battalions assigned to divisions one company usually formed the assault detachment, the second company the mine laying squads and the third the road-building detachments. In several battalions two companies were formed into assault detachments and the third company into the mine laying and road-building squads.

The company assault and mine laying detachments had the following composition: 12 to 16 sappers, one rifle squad with light machine guns,

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8 to 10 submachine gunners and 3 antitank weapons.

In the preparatory period the assault and mine clearing detachments conducted many exercises with rifle and tank units on models constructed in the rear areas. Special exercises without riflemen, were conducted in which engineer reconnaissance, techniques of mine lifting, and the exploding of VV charges were practices. Exercises were also conducted with the rifle units in which problems of cooperation were worked out. Some of the realistic training exercises were conducted with live fire and with artillery participation. By the 8th. of January the training of the assault and demolition detachments had been completed and the participating troops were tested by the higher command in controlled exercises.

Sketch 20 (not included in the translation - can be found on page 124 of the original) shows the disposition of the assault and ^{mine} clearing detachments in the battle order of an advancing battalion.

The engineer support for tank units was organized as follows: A company of the engineers - sapper battalion together with the sapper platoon of the tank brigade formed a detachment consisting of 65 to 80 sappers. The detachment had between 2 to 8 mine detectors, up to 26 pincers, between 7 to 25 grapnels, 4 wire-cutting shears, and between 30 to 40 standard charges VV of 3 to 5 kg. each.

The detachment was divided into four groups:

The Reconnaissance Group (10 to 14 sappers) had the task of reconnoitering the paths for the tanks from their departure positions and to ascertain the character of the obstacles for the further movement of tanks.

The mine clearing Group (13 to 19 sappers) had the task of preparing passages through the minefields.

The Escort Group (18 to 30 sappers) had the task of preparing the departure position and the route of march to the forward position and to assist tanks at obstacles and in the removal of damaged tanks.

The Support Group (15 to 22 sappers) had the task of preparing the supplies and providing the necessary replacement and supplies to the

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detachment.

For the immediate support of the tank breakthrough regiment a group of 1 officer, 4 sergeants, and 11 to 13 sappers were assigned to each of tank company.

The tank support detachments also conducted daily exercises in overcoming obstacles, mine lifting and escorting of tanks. Some of the exercises were conducted with tanks to study problems of cooperation with them.

To secure the flank of the attacking group a defence area was created on the left flank of the 8th. Army which was reinforced by mine fields (consisting of 10,164 anti-tank and 2,885 antipersonnel mines) and wood and earth embankments.

The direction of the work of the engineer group was conducted by visits of the Front Engineer Commander and by officers of the field headquarters of the Front Engineer Troops at the location of the work. The Engineer Troops Field Headquarters also had telephone communication and telegraph with the staff of the Second Shock Army but this was often damaged and could only be used on occasions. The main means of communication available to the field headquarters of the Engineer troops were the automobile, messengers on foot and skiers. The Field Headquarters also had telephone communication with the staffs of the engineer brigades and with several of the engineer units, but only during the preparatory stage since the limited number of lines did not allow the employment of this means of communication until the beginning of the attack. The engineer brigades did not have a satisfactory means of communication with its units. Only the guards mine laying regiment could receive radio messages.

The Engineer Forces and Equipment

The Engineer forces taking part in the operation were divided between the armies. At the disposal of the Front Engineer Commander there remained one company of the army engineer battalion, four motor pontoon bridge battalions, the staff of the field construction command, a guard mine laying battalion, one platoon of the separate camouflage company,

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two platoons of the separate hydrotechnical company, and the engineer machine park. The Front retained as its reserve two separate divisional sapper battalions and a separate sapper company of a rifle brigade. Table 2 shows the distribution of the engineer troops among the armies of the Volkov Front.

Name of unit or formation	2nd. Shock Army	8th. Army
Separate divisional Sapper Battalions	11	4
Separate Sapper Companies of Rifle Brigades	3	3
Separate Sapper Companies of Tank Brigades	4	-
Army Engineer Battalions	1	1
Engineer Brigades of Special Designation	1	-
Separate Engineer Sapper Brigades	1	-
Separate Motor Engineer Battalions	1	1
Separate Mine Sapper Battalions	1	-
Engineer Mine Brigades	-	1
Platoons of Separate Camouflage Companies	2	2
Total Sappers and Engineer Companies	65	32.

The breakthrough front of the 2nd. Shock Army was approximately 12 km. long, besides the 3 km. which the army held along the shores of Lake Ladoga, it therefore can be said that the army had 5 companies of engineer troops per km. of breakthrough frontage. Such an allotment of engineer troops has to be considered as completely sufficient. The state of training of the sappers was on the whole satisfactory. The engineer units and formations of the Front had many deficiencies and were not trained nearly as well.

The amount of official entrenching equipment was sufficient. The Front Engineer units even had a surplus of these. The position concerning special engineer equipment was considerably worse. There was a shortage of explosive devices, of line wire, and of devices to test radio sets; many of the mine detectors did not work because of the lack of dry batteries and special tubes, the generators for the command posts were in bad condition, and there was a shortage of lighting and charging stations.

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The authorized engineer equipment was assembled in two Front and two Army dumps, the latter was located 30 to 40 km. from the front line. The supply of engineer equipment from Front to Army depots was done by railway and transport, but from the Army depots to the troops, it was done by mobile detachments. This enabled the Army to have a reserve of engineer supplies and material 10 to 12 km. from the front line.

Conclusions

1. Engineer reconnaissance will only give satisfactory results when it is conducted in a unified system in cooperation with all types of ground and air reconnaissance. A special group of officers from the intelligence section of the headquarters should be organized to interpret air photographs and to analyse the information received from ground sources and to combine this information. An engineer officer should be a member of this group.

The commanders of the assault groups and of the leading rifle battalions should be issued not later than two days prior to the attack annotated air photographs or panorama of the forward area of the operation with reference points for artillery, tanks, infantry and sappers, as well as the necessary legends showing the type of terrain, the approaches, obstacles, and defences constructed by the enemy.

2. Camouflage discipline of the troops had not reached a satisfactory level up till then, and the engineers and staffs had not paid sufficient attention to problems of camouflage. Due to poor calculation of the time required for marches and delays en route separate columns were still on the road after daybreak. According to statements by prisoners the attack was not a surprise to the enemy. The garrisons of the defended points were aware of the preparations and they had posted stronger guards and had replenished their battle supplies.

3. Road construction on the sector of the breakthrough was on the whole timely and satisfactory as far as the roads leading up to the rear is concerned.

4. The preparation of the protective defences in the base of the

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operations can not be considered as correct. The base of operations ~~was~~ should be laid out to fulfil the requirements of an advance and it ~~should~~ should not become a "storage area" for material for a defence. The base of operations should facilitate the movement forward and should have sets of trenches, running parallel to each other and perpendicular to the front with partial use of constructions designed for defence. Labor commands from the troops which are designated to take over the defence of the area are to be sent forward in time to build these defences. Work on the forward line should be done exclusively at night, and in the immediate vicinity of the enemy only by subunits which are defending the area, and who are familiar with the situation.

5. The assault and ^{mine clearing} detachments were much too large and did not have enough fire power; mortars and guns were absent, and there was not even an artillery observer. The chemical warfare men, although they were included, had only incendiary ampules. Flame throwers and smoke cannisters had not been provided for. Neglected was the preparation of safeguards to indicate passages through the demolitions. The placing of signs did not assist in finding the passages.; some of the signs were 1 st, some were covered by snow, the location of some passages was forgotten, and had to be reconnoitred again. Internal administration had also not been organized satisfactorily.

A serious shortcoming in the training of the assault detachments was also the fact that it finished with the practice of the assault in the forward area only. The infantry did not practice at all the battle in the depth of the enemy's defence, and also did not practice the speedy fortification of the captured area. Little attention had been paid to problems of communications and administration. The addition of first aid boxes would have been appropriate at least in the reconnaissance group of the demolition detachments.

6. The organization of the Engineer Troop Field Headquarters made close control and direction of the troops possible and should have also been of greater assistance to the troops in helping them to solve their tasks.

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The staffs of the engineer units were poorly trained in work and manoeuvre under battle conditions. The lack of mechanical means of communications in the engineer units and the insufficient provision of these at brigades further increased the difficulties of direction and control. The despatch of messages by runners often delayed the delivery of documents and instructions and did not allow the commanders of some of the engineer units to react in time to changes in the situation.

7. The units had several entrenching instruments on their table of equipment and furthermore there were several in reserve in the dumps. There were serious shortcomings in the employment of special engineer equipment.

The control of the issue of engineer equipment was handled poorly. The absence of accounting records on the work sites made it impossible to get a clear picture of the level of employment of engineer tools and equipment.

8. The limited amount of transport available in the Divisional Engineer battalions and the overloading of the divisional transport did not make it possible to have the troops move their engineer equipment with their own resources. Therefore the placing of the additional requirement on the divisions to move the engineer equipment was unreasonable.

In order not to leave the engineer supplies in the rear the Engineer Army Commander should have had available, under his control, transport to move the necessary equipment, regardless of where it had to be moved to. The inability to support the engineers with transport and POL seriously hampered their work.

9. It was found necessary to supply the sappers with cover against bullets and shrapnel while preparing for mine laying. Steel shields (on wheels in summer and on skis in winter) should not have been excluded. Also, it was necessary to work out the distribution of the man-carried equipment between the demolition and assault groups.

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The Action of Engineer Troops during the Breakthrough

By the 11th. of January, 1947, ~~the~~ divisions and rifle brigades of the first echelon moved to their departure positions, having trained assault and ^{mine lifting} detachments. During the night from the 11th. to the 12th. of January the divisional sappers prepared passages through our own minefields and marked them.

On the 12th. of January, after an artillery preparation, the assault and ^{mine lifting} detachments following the barrage closely started to move ahead of our infantry in the fulfillment of ^{their} tasks.

The reconnaissance and ^{mine lifting} detachments operating between the workers settlement No. 8 and copse "Kruglaya" encountered 600 to 700 meters in front of the enemy, wire entanglements and other obstacles. After preparing passages through these obstacles the groups continued their advance without meeting any opposition. After having advanced for about 2.5 kms., both groups and the rifle battalion which was following them were caught in a fire trap from 5 well-hidden emplacements on the right flank, from mortar fire in the front and from the left flank, from copse "Kruglaya", machine gun fire. Even though the anti-tank guns which were included in the assault group destroyed one fire position all further forward movement of the battalion was halted and it, together with the assault detachment, withdrew to the departure position.

The assault and ^{mine lifting} detachments operating in the direction of copse "Kruglaya" advanced under enemy fire for a distance of over one kilometer ahead of the infantry. Operating independently the detachment bypassed copse "Kruglaya" and advanced to the Putilovsk highway at the western approaches of the copse where it engaged enemy infantry, which was supported by two tanks. As a result of the battle the enemy infantry withdrew and one tank was destroyed.

The assault and ^{mine lifting} detachment operating to the left of the copse "Kruglaya" prepared for battle during the period of the artillery preparation. The reconnaissance group, quickly and with determination, started to move towards the enemy defences and soon encountered wood and earth emplacements. Overcoming this obstacle, the

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group continued its movement towards the wire entanglement.

The ^{mine clearing} group, following the reconnaissance, started to move forward with just as much determination. Reaching the first wall the group enlarged the five passages which had been cut through by the reconnaissance group. On reaching the wire entanglement, the group also made passages through it. Emerging from the wire entanglement the group started out in the direction of the earth and wood defended point which was situated about 70 m. to the right, but heavy machine gun fire from this point stopped the group and forced it to dig in. The ampule throwers opened fire against the embrasures but the discharger was soon damaged. By that time the assault group approached and attacked three fire positions. But it was not possible to capture them. Besides this the artillery and machine gun fire on the group increased in intensity and the distance between the assault group and the attacking infantry battalion was about 700 to 800 meters. The assault group commander started to call for infantry support via messenger but only the fifth messenger was able to accomplish his mission. The infantry tried to ~~leave~~ leave the trenches and dugouts but were pinned down by enemy fire. As a result the assault group had to wait for the arrival of infantry until nightfall.

During the night the assault and demolition squads were re-supplied with ammunition and explosives and at 0900 hours in the morning of the second day the detachment started to advance beyond the wire entanglement under heavy enemy fire. At 0945 hours two of our tanks appeared. Our sappers showed them the prepared passages. Following the tanks the infantry started to attack.

The engineer detachments supporting the tanks immediately started to prepare passages to the forward edge of the enemy's defence; the passages through our minefields were checked and occasionally widened, and clearly marked with signs and lanterns. The tanks, consequently, crossed our minefields without a mishap, except for one instance when the tanks, despite the signs and posters did not use the cleared passages.

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Much more difficult to solve was the problem of supporting our tanks in the depth of the enemy's defense. While in the forward defended zone the sappers had been able to guide the tanks and point out obstacles and difficult locations, thereby directing them to the better passages. This was not possible in the enemy's depth. In the first place, as is proper, the tank commanders did not point out to the sappers the direction in which they intended to move, and, in the second place, the tanks pushed ahead and began to operate independently without the assistance of the sappers. If the tanks had followed the sappers, they would have stood still quite often and would have presented easy targets for the enemy anti-tank artillery. The assistance which sappers can give to tanks consists in that the sappers remove mines which lie in the path of the tank or else check the passability of the area, prod the area ahead of the vehicle, but to dismount and remove the obstacle was not successful. Therefore, shortly after the start of the battle the main ^{force} ~~part~~ of the sapper groups, without regard to their assigned tasks, was engaged in the evacuation of damaged and bogged down tanks.

The road and bridge-building detachments which had been assigned to the divisions were employed by the divisional engineers in the main as a reserve and for the construction of command posts. The main roads in the area of the 2nd. Shock Army were built behind the advancing troops by the engineer battalions of the Front Commander's Reserve. The road work was done by hand and they cooperated in cleaning the route from snow; in several instances the engineer battalions had to clear the main part of the road of mines. The roads leading across the peatfields developed many potholes since they were only thinly frozen over and demanded continuous repair. During the period of the attack altogether 30 kms. of new roads were built in the area of the 2nd. Shock Army, as well as 28 kms. of roads being repaired, and 8 bridges restored or newly built.

The fortification of the area captured from the enemy proceeded slowly and under pressure of the front command. The divisional and

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regimental commanders did not, on their own, undertake to fortify the newly captured areas.

General Conclusions

The Assault and Mine Clearing Detachments : The action of the sappers of these detachments was decisive. Beside the completion of their assigned tasks - the elimination of enemy obstacles, the making of passages, the defence and destruction of fire points - the engineer troops by their action in the forward element of the infantry showed that they knew how to use not only engineer equipment but also how to fight with the bayonet and the grenade.

The successful activity of the assault and the mine clearing detachments was a result of the careful and full preparatory training which they had received. However it has to be remarked that in several detachments that infantry which had trained with the engineers had not been assigned to it and this reduced the coordinated action within the detachments. In several instances the fire means which had been allotted to the detachments were withdrawn, leaving the sappers without adequate fire support.

The sappers after having cut through the passages and overcome the obstacles joined the rifle teams and acted as riflemen. There were instances where the sappers were employed as riflemen from the very beginning of the battle. All this resulted in depletion and unnecessary losses in engineer troops.

The fact that our infantry lagged behind our assault and mine clearing detachments and often lost contact with them destroyed the success of their combat action. The sappers, in these instances, of necessity, had to take upon themselves the infantry tasks and suffered considerable casualties on account of it.

Careful reconnaissance proves to be one of the main conditions for successful action by the assault and mine clearing groups. The commanders of these groups should be given maps of the area 2 to 3 days in advance of the operation showing the type of terrain and the enemy defences in the area of the proposed action. This gives the detachment com-

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manders the opportunity to familiarize themselves with the area and to instruct the commanders of the reconnaissance, demolition, and fire groups.

The Organization of the Assault Detachments : The organization of assault and mine clearing detachments used by the 2nd. Shock Army must be called too cumbersome. Keeping in mind laid down principles, an assault group should consist of four sub-groups: reconnaissance, mine clearing, assault, and fire. Besides that, the commander should have the right to, and use, the opportunity to call for fire from the supporting artillery.

The reconnaissance sub-group is necessary because in the preparatory period it is useless to hope for exhaustive reconnaissance data and a detachment would draw attention on itself. Six sappers are enough for a reconnaissance subgroup in order to send out two pairs of outposts and have one pair conduct reconnaissance. The work of the reconnaissance group is to be covered by sub-machine gun fire.

The mine clearing group : The composition of this group will depend on the mine lifting conditions: three sappers in front inspect the passage (one with a mine detector, two with prodders), following these come four sappers, who disarm the mines, the group is closed by two riflemen who mark the passage. Submachine gunners are detailed to cover the work of the sub-group. The part of the sappers can be taken by infantry soldiers who have been trained in engineering.

The assault group: It will be composed of a squad of sapper-demolition men, two squads of riflemen, armed with light machine guns and sub-machine guns, tank fighters armed with anti-tank weapons, and chemical warfare men for laying smoke screens. The latter can be assigned to the mine clearing groups. The assault sub-group can be reinforced by tanks and flame throwers or ampule throwers. A sample assault group is shown in Table 3.

Assignment and Specialty

Table 3
Sub-Group

	<u>Rece</u>	<u>Minelifting</u>	<u>Assault</u>	<u>Fire</u>
Commanders of sub-groups	1	1	1	1.

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Messenger for Commander	6	7	8	-
Sappers	-	2	-	-
Riflemen	3	3	3	-
Submachine Gunners	-	-	1	-
AT Rifle Squad	-	-	-	2
Heavy Machine Gun Crew	-	-	-	1
Mortar Platoons	-	-	-	1-2
AT Gun Crew	-	-	3	-
Liaison with Artillery	-	-	3	-
Chemical Men for Smoke Screen	-	-	3	-
First Aid Team	-	-	3	-

The assault group will be formed on orders of the regimental commander and by the battalion commander from personnel of the rifle companies, in whose direction these groups will be operating. The necessary reinforcements are assigned by the regimental commander. He also states which artillery will support the group. Such an organization has the further advantage that the group maintains close connection with the rifle companies from which they are organized.

A supporting group may be organized in the size of a battalion because a battalion will have no more than two assault groups, and it can fully support these. The supporting group will be responsible, besides giving the assault group the necessary engineer equipment, for organizing the guarding and holding of the marked passages, if these tasks are not done by special engineer service troops. Considering that the situation may demand the protection of two sub-groups, it is enough in the support group if there are two squads of sappers and one squad of rifle men.

In those circumstances, when the rifle battalion only organizes one assault group, the companies in whose direction the assault group does not operate, will have to have independent mine lifting groups. The latter will have the same composition as the mine lifting sub-group of the assault group, and above that, will send out one or two pairs of outposts (Sketch 21 - not included in the translation- can be found on

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page 132 of the original).

The assault groups should be instructed in crawling over walls, they should know how to utilize ground (holes, craters, ditches, vegetation), how to run or crawl from one covered place to another, should know where it is necessary to use smoke.

A variation of the organization of the battle order of a rifle battalion, having in its establishment assault groups is shown in Sketch 21.

Tank Security detachments: Until now no means of transporting sappers has been evolved. Sappers on foot cannot protect the battle action of tanks because to limit the speed of movement of tanks to the speed of the leading sapper is not permissible. Even in the sapper platoons of the tank brigades, which have transport on their establishment, this is not suitable for action with tanks on the field of battle. It is absolutely necessary to equip the sappers with armoured transporters.

The sappers should know the course on which the tank subunits would operate. Even this had its place in the current operation, because, even though the sappers lacked transport, they could have, up to a degree, prepared the roads for the movement of tanks in the enemy zone, even if that was only in the forward area up to 1000 metres deep.

In principle the distribution of the tank protection detachments between the reconnaissance, mine lifting, escort and protection groups is correct, just as in the first phase, in the movement forward edge to the of the enemy, the detachments completed their tasks successfully. If in further operations the sappers were unable to support the tanks, this was only because they lacked the means of transport, which would have enabled them to move at the same speed as fast-moving armoured vehicles.

The problem of assisting tanks which were bogged down in the swamp and whose tracks were jammed with peat, the problem of breaking them loose and cleaning their tracks was protracted because in order to pull a tank out on to the hard ground the sappers had to bring rollers from a great distance which slowed down the operation considerably. It is necessary to work out a quicker method. As a partial solution, it is

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necessary to carry along prepared supports.

The absolute necessity of quickly fortifying a locality is still not well enough understood by infantry and formation commanders. The method of work with commissions for the preparation of defended zones can only be regarded as adequate in the rear areas of our troops. During an advance into the depth of the enemy's defences the task of consolidating success by quickly assuming a defensive position on the captured objects is the duty of every commander (Infantry Combat Service Regulations, 1942, 2nd. part, page 464).